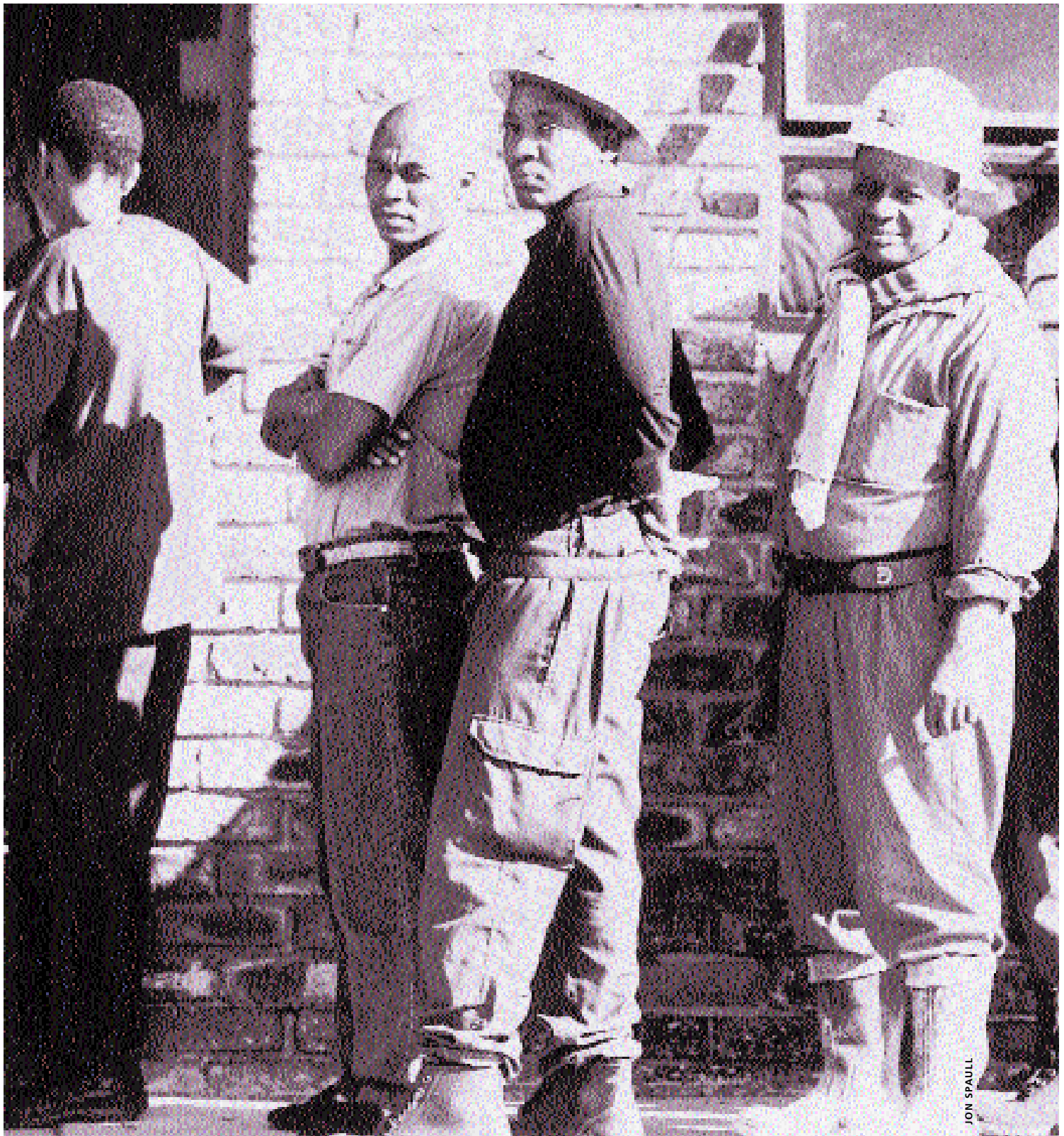


Comparing the expected benefits of public health interventions against the implementation costs can provide a powerful argument for sustaining such interventions.



JON SPAULL

HARMONY MINING COMPANY WORKERS WAIT TO RECEIVE THEIR PAYCHECKS IN VIRGINIA, SOUTH AFRICA, THE SITE OF A COMMUNITY PROJECT USING PERIODIC PRESUMPTIVE TREATMENT (PPT) OF SEXUALLY TRANSMITTED INFECTIONS AS AN HIV PREVENTION STRATEGY.

LESEDI: SERVICES FOR WOMEN AT HIGH RISK HELP REDUCE SEXUALLY TRANSMITTED INFECTION (STI) PREVALENCE IN A SOUTH AFRICAN MINING COMMUNITY

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LESEDI: SERVICES FOR WOMEN AT HIGH RISK HELP REDUCE SEXUALLY TRANSMITTED INFECTION (STI) PREVALENCE IN A SOUTH AFRICAN MINING COMMUNITY

INTRODUCTION

The highest rates of HIV infection in the world occur in southern Africa, where some of the countries with the highest per capita income on the continent are most affected. Factors such as rural poverty and the migration of individuals in search of work contribute to the separation of families, resulting in high-risk sexual behaviour. Moreover, high rates of curable sexually transmitted infections (STIs) also facilitate efficient transmission and rapid spread of HIV.

South Africa has seen a major HIV/AIDS epidemic unfold with alarming speed since HIV prevalence was first measured in 1990. Since then, HIV-prevalence rates among pregnant women have increased from less than one per cent to more than 20 per cent in some provinces. Urban areas and regions with large communities based on mining or other industries are strongly affected, but HIV rates are also increasing in the rural areas from which many migrant workers originate. By the end of 1997, 2.9 million South Africans were living with HIV, an estimated 420,000 people had developed AIDS, and 360,000 people had died of AIDS-related illness. In addition, almost 200,000 children under 15 had lost one or both parents to AIDS.

BACKGROUND

Commercial sex is a prominent feature around many South African mines, where thousands of male migrant workers live in single-sex hostels. Genital ulcers due to chancroid, syphilis and herpes simplex virus are common, as are non-ulcerative STIs such as gonorrhoea, chlamydial infection and trichomoniasis. Such high rates of curable STIs in South African mining communities create ideal conditions for HIV transmission.

Sex work encompasses diverse types of relationships in the South African goldfields, where high-risk casual or commercial sexual encounters are common for migrant workers living in the hostels. Many local women, faced with limited economic opportunities, provide sex in exchange for money or other material support. Although they do not necessarily identify themselves as sex workers, they are, nonetheless, highly vulnerable to STIs. While mining companies generally provide quality health services for their employees, the men's casual partners often find themselves with few options for STI prevention or treatment. Miners, in turn, suffer repeat infections when, despite effective treatment, they return to partners who have not been cured.

PROJECT SUMMARY

The Lesedi Project began in October 1996 as a collaboration between Harmony Mine Hospital and Family Health International's (FHI's) AIDS Control and Prevention (AIDSCAP) Project, funded by the United States Agency for International Development (USAID), in response to high rates of STIs, including rapidly increasing HIV prevalence, in South African mining communities. During the first year, mobile-clinic services were established and a peer educator network organized among women at risk in the community.

In the first nine months of the project, peer educators raised awareness of STIs and prevention methods. More than 400 women attended the clinic at least once for examination, counselling and treatment. Clinic protocols were designed to provide effective treatment for the most common curable STIs in the community: all women attending the clinic were offered presumptive antibiotic treatment based on their high risk of exposure. Additional treatment was added, as needed, for women who were symptomatic.

For the evaluation of this first phase of the intervention, STI rates were measured both for the women attending the clinic and the miners living in the area. Among women using the services, STI prevalence was reduced by 70–85 per cent. Local miners screened nine months after the start of the project were found to have a 43 per cent lower rate of gonorrhoea/chlamydia infection and 78 per cent fewer genital ulcers than they had had before the intervention. STI consultation rates at mine health services were also monitored, and miners living in hostels near the intervention had significantly lower rates of symptomatic STIs than those living

farther away. In addition, self-reported condom use during commercial sex rose from negligible levels to 20–30 per cent of encounters within nine months.

By the end of the first year, evaluation results, projections and a cost-benefit analysis were prepared and presented to the management of Harmony Mines. Based on the results, the company, with support from the Department of Health, assumed the management and implementation costs of the project. A steering committee with representation from all stakeholders was formed to oversee the project and guide expansion to neighbouring mining communities.

Since the end of the first phase in mid-1997, services for women at high risk have been expanded. In 1999 the original project area was served by a fixed clinic provided by the mines, and the mobile clinic had been moved to a nearby township. Three full-time nurses were providing services, with plans underway to add two more mobile units. Lesedi peer educators and clinic staff now cover all the high-risk areas in the original town (population >100,000) and have recently started working in a nearby mining town.

PROJECT GOALS

The initial objective of the intervention was to rapidly reduce community prevalence of curable STIs by providing effective STI preventive and curative services to women at high risk of infection.

Current objectives are to extend the intervention to new areas, while maintaining reduced STI prevalence in established areas through a combination of barrier protection and effective treatment services.

MAJOR COMPONENTS OF THE LESEDI PROJECT

The Lesedi intervention was designed and implemented to address a major gap in STI-control efforts in the mining communities: significant reductions in STI rates would not be achieved, it was argued, unless acceptable, effective services were available for the principal groups at risk. The situation analysis carried out during the planning phase revealed that even the most basic services were not available to many of the casual and commercial sex partners of the miners. State-of-the-art STI diagnosis and treatment for miners would have little impact on STI prevalence if the men's partners had poor access to prevention or treatment services.

At the start of the Lesedi Project, this gap was addressed by establishing mobile clinical services for sex workers and other women at high risk of STI infection living around the mines. These services were strongly supported by outreach and behaviour-change activities intended to promote attendance at the clinic and encourage safer sexual practices. Several key principles guided the design of services:

- In order to attract and engage the women most in need of services (with highest STI risk), the women themselves participated in the design of the services provided.
- Since community promotional work was considered as important as clinical services themselves, this aspect was entrusted to peer educators selected from among the women using the services.
- The emphasis was placed on making sex safer—not on eliminating or discouraging commercial or casual sex. Non-judgmental attitudes were considered essential to gain

the trust and participation of the women most in need of project services.

- In order to minimize stigmatization, a broad approach to outreach was adopted. While many of the women who were reached identified themselves as sex workers, others with fewer partners or other jobs did not. Outreach and clinical services were organized to meet the needs of women at increased risk of STI infection because of casual or commercial contact with multiple partners. Labels such as “prostitute” or “sex worker” were avoided to minimize discrimination and facilitate acceptance within a largely conservative rural community.
- Given the inaccuracy (due to low sensitivity) of available diagnostic tests for STI, an approach was needed that effectively treated the maximum number of curable STIs in the women coming for care.

Setting up the Services During the first year of the project, the emphasis was on developing and testing strategies for providing effective STI services that would be used by women at high risk in the community. Key concerns were:

- Reaching the women most in need of STI preventive and curative services.
- Designing the services in such a way that the women would use them.
- Adopting an approach for detecting and treating STIs that would be effective and appropriate for women with high levels of exposure.

As a first step, a situation analysis was undertaken to explore the dynamics of commercial sex around the mines. Researchers from a local university interviewed sex workers, miners, tavern

owners and others. The AIDSCAP *Manual for Targeted Intervention Research on Sexually Transmitted Illnesses for the Setting of Commercial Sex*,¹ an ethnographic research tool for assessing attitudes, perceptions and behaviour related to commercial sex, guided the data collection and interpretation. Results confirmed that STIs and high-risk behaviour were common and that women involved in sex work had poor access to prevention and treatment services.²

Based on these findings, more detailed mapping was carried out in an area chosen for the initial intervention. A residential community with a population of 6,000 to 10,000 situated among three mine hostels (4,000 miners) was mapped to identify taverns, shebeens (informal liquor outlets) and other meeting places where miners relaxed after work. A central location near a shopping area was chosen as the initial site for providing mobile services.

Choosing an Effective Strategy for Diagnosing and Treating STIs

In designing the clinical services for high-risk women, a major concern was to adopt an approach that would accurately identify which women needed treatment. The objectives of the STI- treatment strategy were to:

- Reduce the burden of disease for these women, thus minimizing their risk of STI-related complications and vulnerability to HIV infection.
- Maximize the impact on community STI-prevalence rates by effectively reducing STI prevalence in a key population group most likely to acquire and transmit STI infections.

Previous experience and findings from the situation analysis suggested that many women around the mines were highly vulnerable to STIs, that

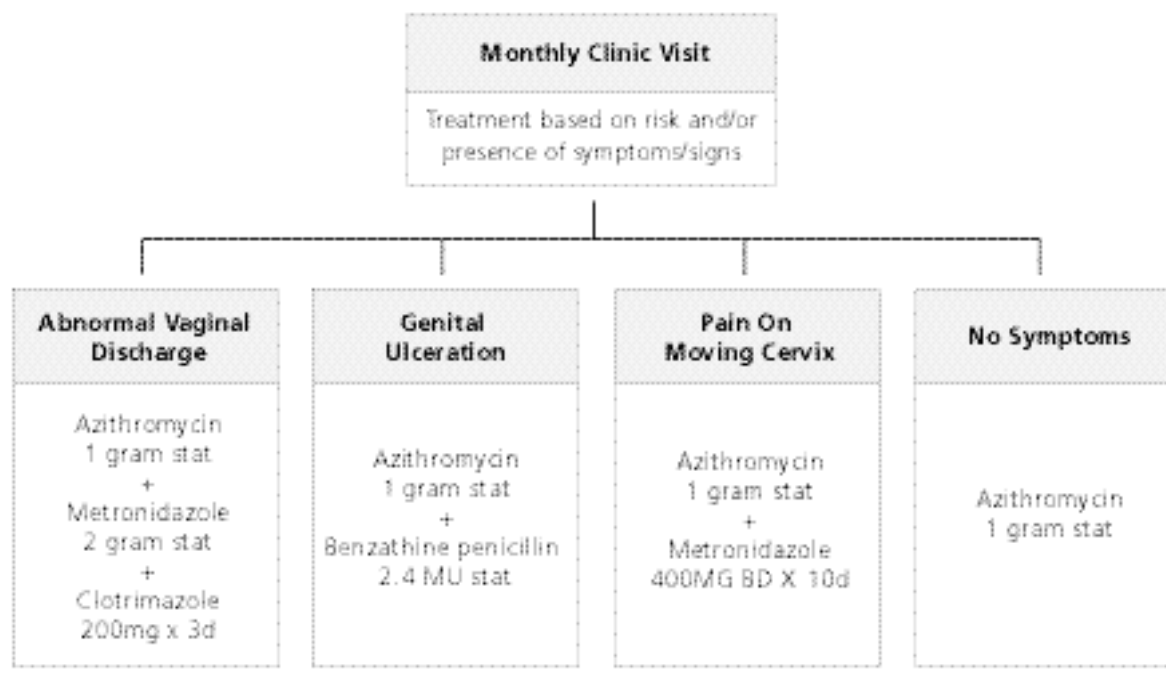
prevalence and exposure rates were high, and that most infections were likely to be asymptomatic. To have maximum impact on STI transmission, it was felt that a “no missed opportunities” strategy was needed to minimize ‘false negative’ results.

As a first step, national syndromic STI guidelines were adapted for use, as previous studies had confirmed their effectiveness for treating individuals with STI symptoms. In addition, two strategies that did not depend on the presence of symptoms in the women were considered. Either periodic screening or presumptive treatment, it was believed, would be sensitive enough to ensure treatment for the majority of women with STIs, regardless of symptoms. Regular screening with sufficiently accurate tests had several disadvantages, however. These included cost, logistical issues and quality control in a community setting. Because of these potential problems, a presumptive treatment strategy was chosen, based on the assumption that prevalence and exposure to STI were high enough to justify treating all the women who presented for care.

The periodic presumptive treatment (PPT) algorithm used at Lesedi is reproduced in Figure 1. All women referred to the clinic by peer educators are encouraged to return monthly for prevention counselling and presumptive treatment with a single one-gram dose of azithromycin. Azithromycin is effective against most of the common curable STIs—chancroid, gonorrhoea, chlamydial infection—and is active against incubating syphilis. Women with symptoms suggestive of STI are given supplemental treatment based on syndromic recommendations. An evaluation of the effectiveness of this approach based on data collected during the first nine months of operation is presented in Sidebar 1.

FIGURE 1

Periodic Presumptive Treatment (PPT) Protocol



Outreach and Promotion of Services

Outreach was organized with the assistance of the condom social marketing company, Society for Family Health/Population Services International (PSI), which was active in the area. Two outreach workers visited the identified meeting places, sought the cooperation of proprietors, introduced themselves to women and explained the purpose of the services. Interested women were given referral cards and encouraged to visit the nurse at the mobile clinic. The nurse, in turn, was able to monitor referrals by means of the cards and met daily with the outreach workers to direct the promotional efforts. Within weeks,

attendance escalated as women attending the services began referring their peers.

Despite early popularity, however, attendance started to drop off after two to three months (see Figure 2). The decrease in first visits was initially interpreted as an indication that most of the eligible women in the area had been reached. However, the team became more concerned when they noted a drop-off in return visits, and the nurse and outreach workers began asking questions. Informal group discussions were held with women who attended the clinic, and perceptions of the services were elicited from women encountered in the community. Several barriers to attendance were identified:

SIDEBAR 1

Periodic Presumptive Treatment: An Approach to STI Service Delivery for Women at High Risk of Infection

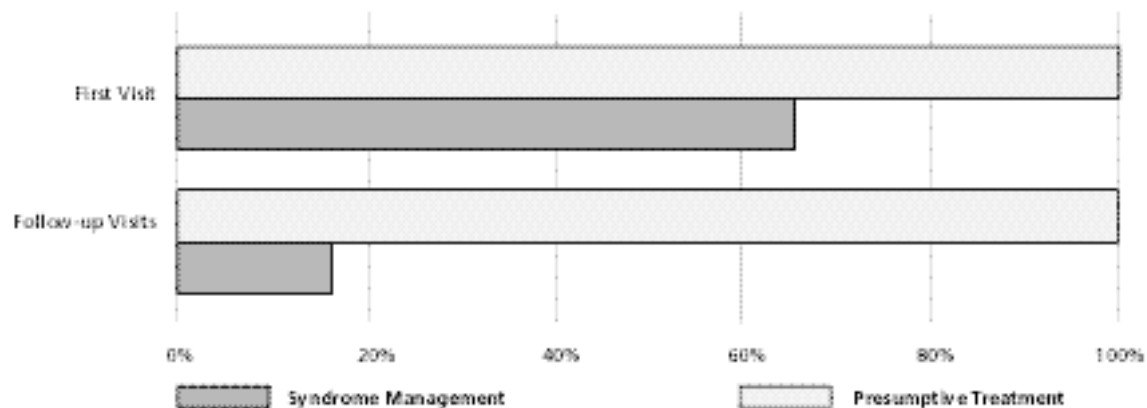
Three STI service delivery strategies (syndrome management, periodic laboratory-based screening and periodic presumptive treatment) were considered when designing clinical services for women highly vulnerable to STI. Both laboratory testing and presumptive treatment require considerably greater resources than syndrome management alone, but may be more cost-effective in populations with high prevalence and exposure to STI.

At Lesedi, periodic presumptive treatment (PPT) was selected over laboratory-based screening because of cost and feasibility concerns and over syndrome management as it was believed that significantly more women with STI would receive the needed treatment if treated presumptively. With syndrome management alone, most STI infections would probably be missed due to the high prevalence of asymptomatic infections. Data collected over the first nine months of the project illustrated the difference in effectiveness between periodic presumptive treatment and syndrome management in treating women with gonorrhoea and/or chlamydial infections.

Using actual prevalence rates of gonorrhoea and chlamydial infection at the initial and follow-up visits, Figure A shows the proportion of STI infections that would be treated using the two approaches. While syndrome management would identify two-thirds of the women needing treatment at first visit (prevalent infections), it performs poorly at detecting new (incident) infection during subsequent visits. Presumptive treatment, by definition, treats all infections.

FIGURE A

Sensitivity of Two Approaches for Treating Gonorrhoea/Chlamydial Infection

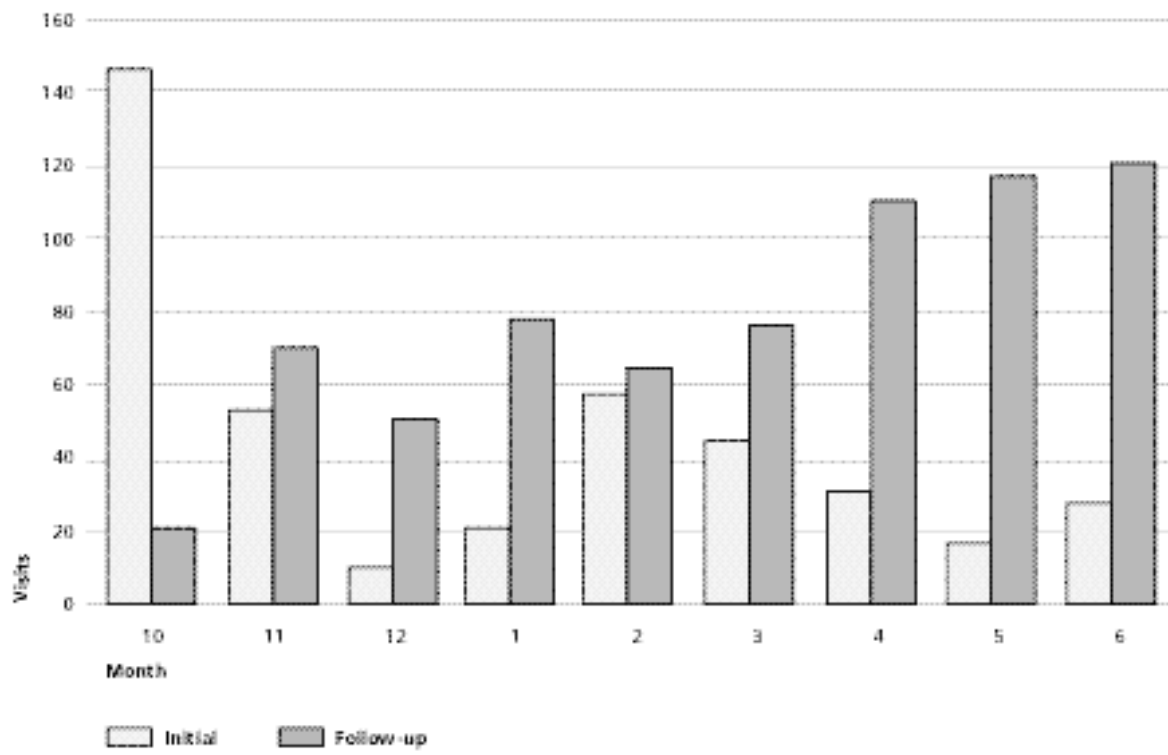


Presumptive treatment would clearly have a much greater impact on STI prevalence than syndrome management alone—at a proportionally higher cost. The cost-benefit analysis summarized in Sidebar 2 considers this cost in relation to the benefits attributable to decreased STI prevalence.

- Rumours about the services were circulating in the community, creating distrust about the objectives of the project. Clinic and outreach staff members were viewed as outsiders with suspect motives and agendas.
- Stigma was also cited as a reason for not attending the clinic. The project nurse heard complaints about the intimate nature of the questionnaire and concerns of clinic visitors that attending the clinic would be seen as evidence that a woman had HIV infection or another STI.
- Women were not convinced of the value of the clinical services and treatment. They expressed confusion about the distinction between HIV and curable STIs and the need for barrier protection against incurable STIs.
- Women disliked having embarrassing questions asked about their sexual practices, and they disliked the discomfort of monthly speculum exams, especially when they had no symptoms. They were also suspicious about the collection of specimens for laboratory testing and were concerned about being identified as having HIV or another STI.

FIGURE 2

Mobile Clinic Attendance Rates: Initial and Follow-Up Visits



Changes were made to address all the issues raised by the women. In order to promote local involvement and build trust, six women who were enthusiastic regular attendees at the clinic were invited to attend a training session for peer educators. An experienced peer education trainer from the Project Support Group in Zimbabwe trained the women and helped organize a system for regular peer educator support and supervision. Peer educators contacted women one-on-one and held group meetings to explain the services and build trust.

The project's clinical services were also adapted to be more acceptable to the women. Since treatment was not dependent on examination findings, a speculum exam was performed at follow-up visits only when women were symptomatic. Efforts were made to improve confidentiality and reduce stigma and to collaborate with the municipal health services to provide a broader range of services, as well as referrals to other needed services. Within a few months of these changes being made, attendance rose to previous levels and more women were returning for follow-up visits.

Consolidation, Expansion and Sustainability

An evaluation of the project, conducted near the end of the first year of operation, confirmed the benefit of the services to the women using them and showed a decrease in STI rates among miners. The clinic was moved to a house provided by the mines with room for an expanded range of services, and the mobile unit was deployed to neighbouring areas. Peer educators met weekly with the nurse to plan activities and discuss solutions to problems encountered. Two nurses were hired for new

project areas. A project steering committee with representation of major project stakeholders met monthly to monitor progress and direct expansion of the project.

PROJECT PARTNERSHIPS AND ALLIANCES

The Lesedi Project began as a collaboration between Harmony Mine Hospital and the AIDSCAP Project of FHI. The initial intervention and evaluation were designed with input from the Reference Centre for STDs of the South African Institute for Medical Research and the Institute of Tropical Medicine, Antwerp, Belgium, and drew on previous AIDSCAP work conducted in the goldfields by the National Progressive Primary Health Care Network and Vista University. The Society for Family Health/PSI assisted with initial outreach efforts and the Project Support Group from Zimbabwe with peer-education training.

With expansion of the Lesedi Project in its second year, a steering committee was formed, chaired by the Harmony medical director and the Lesedi project nurse. Other area mining companies were invited to participate, as were the provincial and national departments of health and the STD Reference Centre. The respective mining companies pledged funds to expand the project in their areas, and the health departments agreed to provide additional support, primarily for evaluation.

Steering committee members have given presentations on the Lesedi Project at regional and national meetings of mine medical officers. The intervention is now being replicated in other mining regions in South Africa.

MONITORING AND EVALUATION

The most comprehensive evaluation of the Lesedi project took place during its first year in the mining community where the intervention was first implemented. Women attending the clinic and local miners were tested for STIs using sensitive assays—urine ligase chain reaction (LCR)—to determine whether the intervention had an effect on STI rates. In addition, continuous monitoring of STI clinic attendance rates in intervention and nearby non-intervention communities has been carried out to follow trends in the common STI syndromes.³

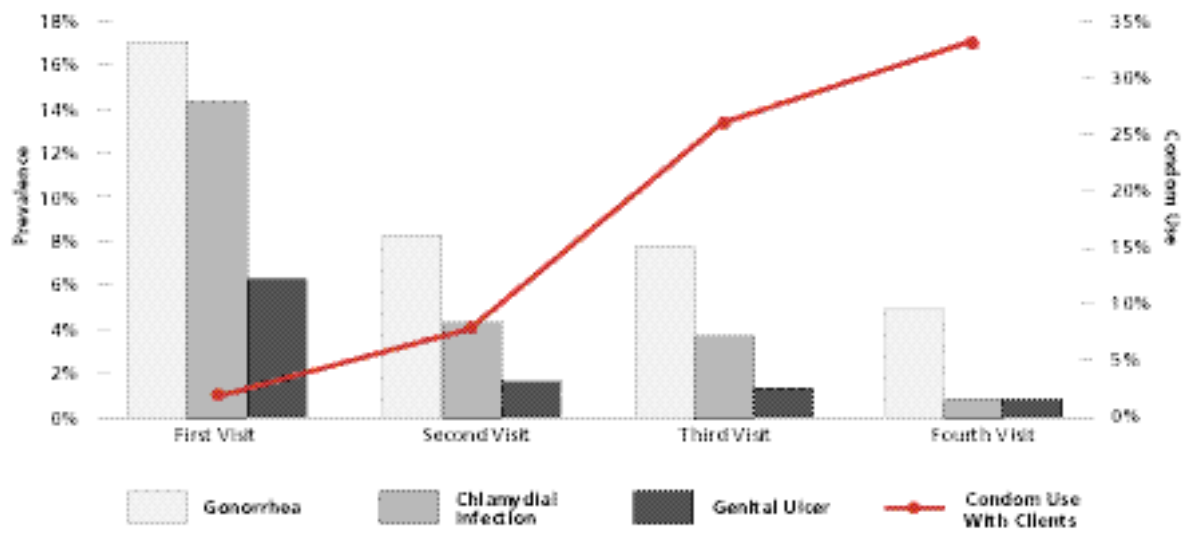
Baseline Levels and Reductions in STI Prevalence and Incidence

Women using Lesedi services: The prevalence of curable STIs among women who attended the Lesedi clinic for the first time was high. Ten per

cent of the women had genital ulcers diagnosed on examination, and a quarter had either gonorrhoea or chlamydial infection confirmed by LCR. One in three women had a positive syphilis serology (RPR), and half had one or more of the aforementioned curable STIs.

Significant reductions in STI rates (see Figure 3) were documented among women returning for monthly visits, although reinfection was common: within a month of the first visit, 12.3 per cent of returning women had a new gonococcal or chlamydial infection. Despite high rates of exposure, however, monthly treatment effectively suppressed STI prevalence among the women attending the clinic. When calculated as person-months of infection compared to baseline, prevalence of the most common curable STIs decreased by 70–85 per cent. Additional evidence suggests that chancroid may have been virtually

FIGURE 3
STD-prevalence Rates in Women and Reported Condom Use with Clients at Baseline and Follow-up Visits



eradicated from the local mining community within the first few months of the intervention. *Miners:* Two measures of STIs in miners were tracked to find evidence that provision of services for women at high risk of infection would have an effect on transmission among their partners. Miners presenting for routine examination prior to going on annual leave were screened for STI—one group before the intervention started and the other nine months later. Prevalence rates of gonorrhoea and/or chlamydial infection, measured by urine LCR, and of clinical genital ulcers were compared. Rates of consultation

for STI problems have also been monitored at mine medical stations during the project.

Significant decreases in STI prevalence were measured. Miners screened after the start of the intervention had 43 per cent fewer gonorrhoea and/or chlamydial infections and 78 per cent fewer genital ulcers (see Figure 4).

Proximity to the intervention site apparently reduced a miner's risk of acquiring an STI. The miners who lived near the area served by the Lesedi clinic had fewer visits for STI treatment than those living at more distant hostels (see Figure 5).

FIGURE 4
STD Prevalence in Miners Before and Nine Months After Intervention

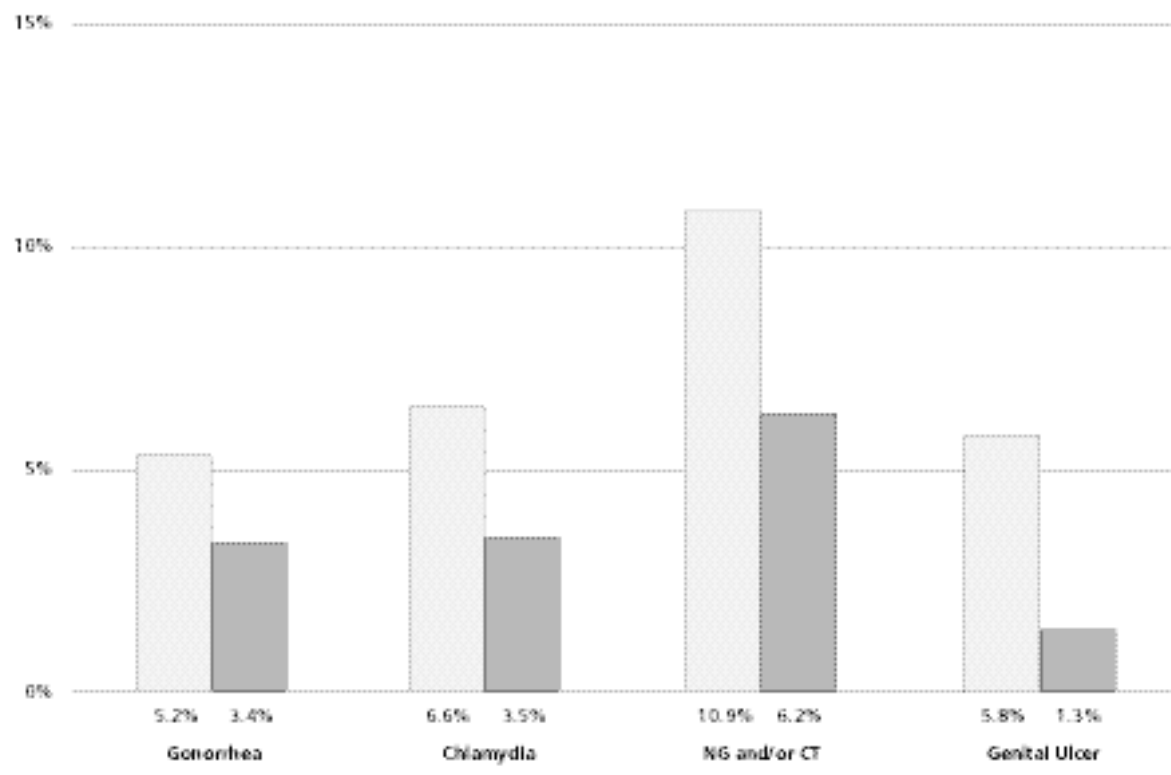
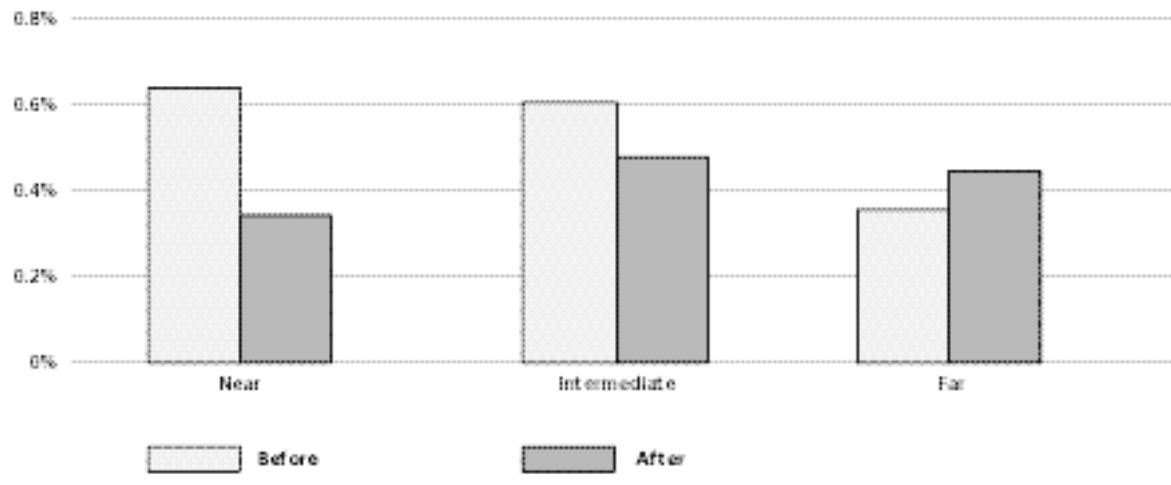


FIGURE 5

Mean Monthly Rates of Outpatient STI Visits (Genital Ulcer Syndrome) by Distance from the Intervention Site



Impact on genital ulcers: Among both women and men, larger decreases in STI prevalence were measured for genital ulcers than for discharges. Because genital ulcers in general, and chancroid specifically, have been closely linked to HIV transmission, further testing was done to determine the specific etiologies responsible for the ulcers.

Samples of ulcer material collected from all the symptomatic women during the first nine months of the intervention were tested. As expected, *H. ducreyi* (chancroid) was the dominant organism detected among women attending the clinic for the first time during the first few months of the project. However, chancroid was not detected in any woman at follow-up visits, nor was it detected among any women attending for the first time after the third month of the intervention. These trends, combined with the dramatic decreases in genital ulcers observed in both the women

and the miners, suggest that chancroid may have been virtually eliminated from the community within a short period of time.

Changes in Self-Reported Risk Behaviour

The risk behaviour of women using the services was assessed by analyzing behavioural data reported at monthly clinic visits. Key indicators were the number of regular/non-regular sex partners and condom use by type of partner. Informal group discussions also were held with peer educators to determine whether any changes in risk behaviour were taking place.

The women's self-reported condom use with their clients increased (see Figure 3), but this reporting may have been influenced by their perception of what was expected of them. Women were also asked to complete coital logs showing the number of sex acts they had engaged in since their last visit and the

proportion where condoms were used. Only about 40 per cent of women completed the coital logs: half reported some condom use, and about one in five sex acts were protected through condom use. Data from miners also indicated a decrease in multiple partners and an increase in condom use during the project period. Peer educators reported that women and miners were having fewer sex partners, were trying to limit the number of casual contact, and were more likely to use condoms, especially with new or casual partners.

Cost-Benefit Analysis Costs of the periodic presumptive treatment (PPT) component of the intervention were tracked and a cost-benefit analysis was carried out based on estimates of averted morbidity and mortality. FHI's AVERT model was used to estimate the number of HIV infections averted in the women using the services and among miners in the area. Hospital costs for inpatient and outpatient care of miners with HIV-related illness were determined from hospital records. (See the cost-benefit calculations presented in Sidebar 2.)

SIDEBAR 2

Cost-benefit Analysis of the Lesedi Project

Comparing the expected benefits of public health interventions against the implementation costs can provide a powerful argument for sustaining such interventions. Simple cost-benefit calculations based on data collected during the first year of the Lesedi project convinced mine management and health authorities to support existing activities and fund expansion of the project.

The costs of carrying out the intervention were derived from project records. Research costs were excluded. Table 1 shows the project costs for one year.

TABLE 1

Lesedi Project Costs For One Year

Annual Costs (In US\$)	
Staff	\$18,000
Outreach	3,360
Rental and utilities	3,600
Supplies and medicines	28,800
Total	\$53,760

SIDEBAR 2 (CONTINUED)

Estimating the potential benefit of the Lesedi intervention is more difficult. As a first step, an estimate of the number of averted HIV infections attributable to the observed changes in STI rates and condom use was made using FHI's WERT model.⁹ Figure 8 illustrates the estimated averted infections during one year for women using the services (40, or a 39 per cent decrease from what was projected) and miners (195, or a 48 per cent decrease). Table 2 shows the average cost of health services for an HIV-positive patient.

FIGURE 8

Estimated Averted HIV Infections

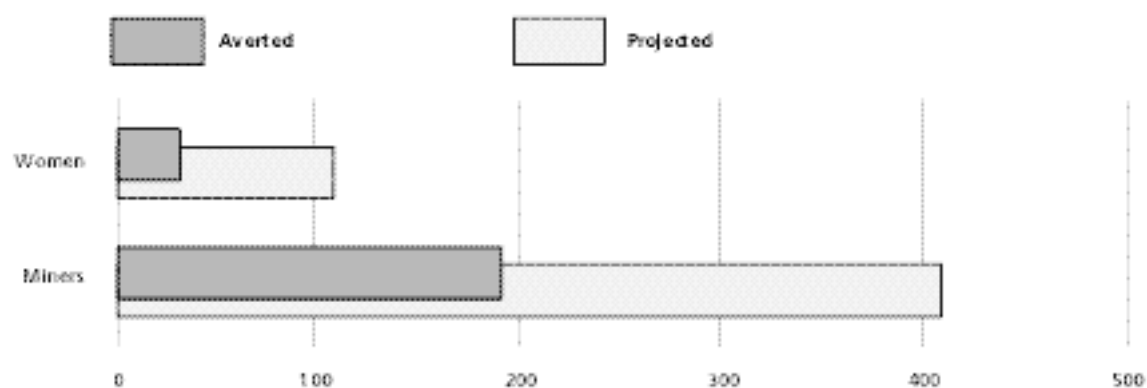


TABLE 2

HIV-related Health Service Costs For Lesedi

Health Service Costs Due To HIV (US\$)	
Average cost/inpatient day	\$72.72
Average cost/outpatient consultation	\$8.87
Average length of stay in hospital	20 days
Average number hospital admissions HIV+	2
Extra outpatient visits for HIV+	15
Average cost per HIV+ patient	\$3,041.60

The medical costs averted—US\$3,042 x 195 estimated averted infections = \$593,190—can then be compared to the annual cost of the intervention: \$53,760.

TABLE 3

Estimated Annual Savings Through the Lesedi Intervention

Estimated Annual Savings (US\$)	
Medical cost savings	\$593,190
Project costs	53,760
Total cost savings	\$539,430

The calculated benefit ratios were high, even when only considering the direct medical costs: the estimated future savings were eleven times the cost of providing the service. A second level of analysis looked at the additional non-medical costs to the mines, including such items as reduced productivity, absenteeism due to illness, labour turnover and retraining, medical repatriation and death benefits. As with medical costs, most averted costs represent expected future savings. Inclusion of non-medical costs increased the benefit ratio more than fourfold.

The AVERT model estimates project outcomes for one year only, which may overestimate the benefit side of the equation. For example, it is not at all certain that someone who avoids HIV infection this year will always avoid becoming infected. Indeed, some costs related to illness might simply be deferred. To account for this possibility, sensitivity analyses were carried out using several different estimates of averted infections, producing a range of 83 to 327 averted infections. However, even the most conservative assumptions resulted in beneficial projections. The direct and indirect costs of HIV are so high that merely averting four infections per year would cover all the costs of the intervention.

Finally, as a cost-benefit exercise for industry, it is important to note that the costs of caring for the other partners of miners who also would become infected with HIV were not considered. Nor was any attempt made to factor in the less quantifiable personal and social costs of HIV infection.

FUTURE DIRECTIONS AND RECOMMENDATIONS

Future challenges for the Lesedi Project, aside from project expansion, include adaptation of the intervention strategy to respond to changing epidemiological and behavioural conditions. Key issues include reducing the frequency of presumptive treatment, increasing levels of barrier protection, strengthening basic STI services and monitoring patterns of antibiotic resistance.

Intensive disease control interventions such as presumptive treatment may be justified when prevalence levels are high enough that the benefits outweigh the costs and potential drawbacks. When effectively implemented, however, they eventually alter the conditions that justify their use. As STI prevalence decreases, for example, monthly presumptive treatment would become less cost-effective—fewer infections would be treated and there would be more unnecessary overtreatment.

Even when justifiable, however, effective STI-treatment strategies are no substitute for primary prevention. Consistent use of barrier methods reduces the risk of all sexually transmitted infection, curable or incurable. High levels (80 per cent or more) of condom use in commercial sex have been shown to reduce STI transmission and maintain lower prevalence rates. It often takes years of behavioural and/or structural interventions, however, to achieve such high rates of condom use.

Presumptive treatment can thus be seen as a potential emergency measure to rapidly reduce STI prevalence in populations with high rates of partner change, low levels

of condom use and high rates of curable STIs. Once STI prevalence is low, however, other more sustainable measures may be more appropriate for maintenance. Such measures should include appropriate support for behaviour change, promotion of consistent barrier protection and access to effective STI treatment. Attention should always be paid to ensuring that preventive and curative services reach those at highest risk of infection.

Future challenges for Lesedi thus include promoting the use of barrier protection at high enough levels to reduce the need for regular presumptive treatment, while adapting STI services to respond cost-effectively to the changing epidemiologic situation. Close monitoring of key indicators, including surveillance of STI trends, is planned, to enable project planners to effectively tailor the intervention to changing conditions. In addition, regular monitoring of antibiotic sensitivity patterns is essential to detect any evidence of emerging drug resistance.

Aspects of the Lesedi experience may be applicable to other settings where commercial sex plays a large role in STI-transmission dynamics. Important principles include participation of the target group in decisions about services, peer empowerment and a comprehensive approach to prevention and treatment. A public health approach, with clear objectives and collection of cost-benefit data, can guide implementation and help ensure sustainability.

It would be more difficult to establish specific criteria (STI prevalence, condom use rates) for including presumptive treatment as an intervention component in other

settings. If condom use is already very high (80 to 90 per cent), there may be little to be gained from presumptive treatment. On the other hand, in commercial sex environments where unprotected sex is common, STI transmission dynamics may justify more aggressive approaches. Any resultant decreases in STI prevalence would serve the interim purpose of reducing HIV-transmission efficiency while the more gradual process of behaviour change takes hold. Protocols recommending different combinations of presumptive treatment and regular screening for sex workers are being evaluated in diverse settings.

BEST PRACTICE CRITERIA

Relevance This experience in implementing a targeted intervention for STI reduction in a mining community is potentially relevant to other communities where the combination of migrant labour and commercial sex create conditions conducive to rapid spread of STIs. It is also an example of the validity of core-group strategies to reduce STI transmission: interventions that effectively reach groups with the highest rates of partner change will have the greatest impact on levels of disease in communities.

Efficiency The demonstrated decrease of STI rates in miners confirms that effectively targeted STI interventions can be highly efficient. Provision of services for 400 women reduced STI prevalence not only in the women themselves, but also in a much larger population of miners as well. Although this was not demonstrated by

the project evaluation, it can be assumed that the benefits of decreased STI transmission also extend to the regular sex partners of the miners.

Effectiveness/Impact Data on STI rates collected during the first year of the project support the effectiveness of this strategy for STI service delivery to women at high risk of infection. Similarly, an impact on STI rates among local miners was documented through several data sources.

Ethical soundness Women and local miners using these services benefited from the project through lower STI prevalence rates. Considerable effort was put into minimizing the possibility of any untoward effect on individuals as a result of participation in the project. Two university-based ethical review boards approved the intervention research protocol, and informed consent was obtained from participants in the course of the project's evaluation activities.

Sustainability The start-up phase of the project was supported largely by donor funds, which were assured for one year only. By the end of the year, after seeing the evaluation results and cost-benefit estimates, mine management and the Department of Health agreed to support the intervention. Since then, the project continued under entirely local support and direction. During the subsequent two years, new areas have been added to the project and two other mining firms have joined the steering committee and pledged support.

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